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PRELIMINARY ACCOUNT OF CORAL SNAKES OF SOUTH AMERICA

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The difficulties attending a definitive revision of the genus *Micrurus* due to the dearth of material for study have been emphasized in previous papers on this notable genus of snakes. Thanks to the opportunity to examine collections in European museums presented by my tenure of a John Simon Guggenheim Memorial fellowship in 1932, and to the cordial cooperation of colleagues, I have been able to combine observations on specimens available in both American and European museums. Further acknowledgment of aid received from friends and colleagues is deferred for a more extended publication.

Some order now begins to appear in the chaos of synonyms, and it is possible to define some of the taxonomic problems and to arrange the valid forms in a preliminary way. When this is done, the list proves to be extraordinarily at variance with the treatment of the genus by Boulenger in the *Catalogue of Snakes* in 1896, and equally divergent from the opinions of Amaral as expressed in his *Lista remissiva dos Ophidios da Regiao Neotropica* in 1929. As a basis for further examination, and I hope for discussion, I offer a list of the South American forms which now seem valid, to supplement my previous account of the North American species (Schmidt, 1928 and 1933). A number of groups of allied forms may now be discerned within the genus; but a consistent phyletic subdivision of the group as a whole is as yet impossible. A purely artificial division of the species into those with the black rings in triads and those without that arrangement simplifies the review; but *M. dumerilii*, *M. circinalis*, and *M. ecuadoreanus* clearly exhibit the development of this type of pattern from the simpler alternation of red, yellow, and black, and it is quite possible that the perfected triad type of pattern may have developed more than once. In the forms without triads the presence

or absence of supra-anal tubercles in adult males has been a useful key to the taxonomy. A specific character which has not hitherto been used is the proportionate length of the tail in the sexes, which may be the same in both sexes or much longer in males.

Micrurus narduccii (Jan).

Elaps narduccii Jan, Arch. Zool. Anat. Physiol., 2, p. 222, 1863.

Elaps melanotus Peters, Sitzber. Ges. Naturf. Freunde, 1881, p. 51, 1881.

Elaps scutiventris Cope, Proc. Amer. Phil. Soc., 11, p. 156, 1869.

Micrurus narduccii Amaral, Proc. U. S. Nat. Mus., 67, Art. 24, p. 19, 1925.

Type locality.—Ecuador.

Range.—Amazonian slopes of Ecuador, Peru, and Bolivia.

Micrurus mipartitus (Duméril and Bibron).

Elaps mipartitus Duméril and Bibron, Erpétol. Gén., 7, p. 1220, 1854.

Elaps decussatus Duméril and Bibron, idem, p. 1221.

Elaps semipartitus Jan, Rev. Mag. Zool., 1858, p. 113, 1858.

Elaps multifasciatus Jan, idem, p. 521, 1858.

Elaps anomalus Boulenger, Cat. Snakes Brit. Mus., 3, p. 417, pl. 22, fig. 2, 1896.

Elaps fraseri Boulenger, idem, p. 432, pl. 22, fig. 3.

Elaps mentalis Boulenger, idem, p. 432, pl. 22, fig. 4.

Elaps hertwigi Werner, Verh. Zool. Bot. Ges. Wien, 76, p. 354, 1896.

Elaps calamus Boulenger, Ann. Mag. Nat. Hist., (7), 9, p. 57, 1902.

Elaps aequicinctus Werner, Zool. Anz., 26, p. 249, 1903.

Elaps microps Boulenger, Proc. Zool. Soc. Lond., 1913, p. 1036, pl. 108, fig. 2, 1913.

Elaps spurrelli Boulenger, idem, 1914, p. 817, pl. 2, fig. 3, 1914.

Elaps decipiens Werner, Sitzber. Akad. Wiss. Wien, (1), 135, p. 250, 1927.

Micrurus mipartitus Ruthven, Mise. Publ. Mus. Zool. Univ. Mich., 8, p. 68, 1922.

Type locality.—Rio Sucio, Colombia.

Range.—Central Nicaragua to Peru and Venezuela.

Micrurus psyches (Daudin).

Vipera psyches Daudin, Hist. Nat. Rept., 8, p. 320, pl. C, fig. 1, 1803.

Micrurus psyches Beebe, Zoologica, 2, p. 216, 1919.

Type locality.—Surinam.

Range.—French, Dutch, and British Guiana.

Distinguished from *M. langsdorffii* of the Amazon Basin by a lower range of ventrals, 192–197 in males, 210–214 in females, and the failure of the nuchal yellow marking to cross the head.

***Micrurus langsdorffii* Wagler.**

Micrurus langsdorffii Wagler, in Spix, Serp. Bras., p. 10, pl. 2, fig. 2, 1824.

Elaps imperator Cope, Proc. Acad. Nat. Sci. Phila., 1868, p. 110, 1868.

Elaps batesi Günther, Ann. Mag. Nat. Hist., (4), 1, p. 428, pl. 17, fig. D, 1868.

Elaps annellatus Peters, Monatsber. Akad. Wiss. Berlin, 1871, p. 402, 1871.

Elaps steindachneri Werner, Verh. Zool. Bot. Ges. Wien, 51, p. 599, 1901.

Elaps fasslii Werner, Sitzber. Akad. Wiss. Wien, (1), 135, p. 249, 1927.

Micrurus langsdorffii Amaral, Mem. Inst. Butantan, 4, p. 230, 1929.

Micrurus mimosus Amaral, Mem. Inst. Butantan, 9, p. 221, 1935.

Type locality.—Rio Japura, Amazonas.

Range.—Amazon Basin.

This is the species usually identified in museums as *M. annellatus*. I interpret the unusual coloration of the types of *langsdorffii*, *imperator*, and *mimosus* as an anomalous color pattern within this species, on the analogy of the Central American *Micrurus affinis alienus*; at any rate, only these three specimens with the ventral surfaces light and the black rings incomplete have been found, while the more normal type, with complete black rings, in which an alternation of lighter and darker is usually discernible ventrad, is known from twenty-four specimens, all from the Amazon basin. *Elaps steindachneri* and *E. fasslii* were based on the same type specimen, as is evident from a comparison of the original descriptions and confirmed by examining the specimen in question in the Naturhistorisches Museum in Vienna. The ventrals range from 195 to 210 in males, and from 208 to 215 (probably to 223) in females.

***Micrurus ornatus* (Jan).**

Elaps ornatus Jan, Rev. Mag. Zool., 1858, p. 521, 1858.

Elaps buckleyi Boulenger, Cat. Snakes Brit. Mus., 3, p. 416, pl. 22, fig. 1, 1896.

Micrurus albicinctus Amaral, Comm. Telegraph. Matto Grosso Amazonas, 84, Ann. 5, p. 26, pl., figs. 7–10, 1925.

Type locality.—Mexico (in error).

Range.—Amazon Basin.

The characters available to distinguish this form from the last are the somewhat inconstant yellow supraocular or prefrontal spots and the higher number of ventrals in both sexes, 202–220 in males and 212–230 in females. It is possible that it should be merged with *langsdorffii*. Specimens with the red zones not darkened, like the type, are connected by intermediates with specimens in which they are completely black, as in the type of *albicinctus*.

Micrurus circinalis (Duméril and Bibron).*Elaps circinalis* Duméril and Bibron, Erpétol. Gén., 7, p. 1210, 1854.*Elaps riisei* Jan, Rev. Mag. Zool., 1858, p. 525, 1858.*Elaps bocourtii* Jan, Icon. Ophidiens, 42, pl. 6, fig. 2, 1872.*Type locality*.—Martinique (in error).*Range*.—Trinidad and adjacent Venezuela.

This form lacks supra-anal tubercles in adult males, and thus is not at all allied to *M. dumerilii* or *M. carinicauda*. The ventral count is low, 180 to 193 in males and 194 to 207 in females, and there is a noteworthy tendency to the reduction or loss of the first temporal. It is certainly fully distinct from *M. corallinus* of southeastern Brazil.

Micrurus balzani (Boulenger).*Elaps balzani* Boulenger, Ann. Mus. Hist. Nat. Genova, (2), 19, p. 130, 1898.*Elaps regularis* Boulenger, Ann. Mag. Nat. Hist., (7), 10, p. 402, 1902.*Type locality*.—Yungas, Bolivia.*Range*.—Amazon drainage, Bolivia.

Amaral refers this species to *corallinus*, from which, however, it is distinguished by the fusion of the lower postocular with the fifth labial. That this is not an adventitious character is shown by the fact that it is uniformly present in the seven specimens known, all from Bolivia.

Micrurus mertensi sp. nov.

Type from Pacasmayo, Peru. No. 94206 Senckenberg Museum, Frankfort, Germany. Adult male. Collected in 1887 by Max Bamberger.

Diagnosis.—A coral snake of the *corallinus* type, without supra-anal tubercles in the male, with the black of the head extended backward on the parietals and connected by a black bar with the nuchal ring. Ventrals 210–221 in males, 232–235 in females, thus distinctively higher than in *corallinus*; caudals respectively 47–51 and 33–37; black rings three or four scales wide, the red zones five or six, the yellow rings distinct, one scale wide; scales of the red zones black-tipped; 22 to 28 black rings on the body and uniformly 8 on the tail in males, 5 in females; the temporals invariably 1–1; no entire subcaudals. The type measures 880 mm., tail 117.

Paratypes.—Four male specimens under Nos. 9420a and 9420b, and one female, 9420b, in the Senckenberg Museum, one of which (No. 18300) has been acquired by Field Museum in exchange.

A second female specimen, from Chanchamayo, Peru, British Museum, No. 1922.11.24.1, agrees exactly with this series. I infer that this specimen is from the Chanchamayo in the coastal province Ancash, rather than from the more familiar locality of the same name near Tarma. There are no less than five different localities with this name in Peru.

***Micrurus peruvianus* sp. nov.**

Micrurus corallinus Dunn (nec Wied), Proc. Biol. Soc. Wash., 36, p. 186, 1923.

Type from Perico, Department of Cajamarca, Peru. No. 17385 Museum of Comparative Zoology. Collected in 1916 by G. K. Noble.

Diagnosis.—A small slender species with the pattern of *corallinus*, without supra-anal tubercles in the male; top of head black nearly to the tips of the parietals, usually connected with the nuchal ring; yellow rings one and a half scales wide; scales of red zones uniformly black spotted; 25–27 black rings on the body and 4–9 on the tail; frontal scute short, nearly as wide as long, little larger than one of the prefrontals. Four specimens out of six exhibit the tendency to reduction of the postoculars to one; two specimens have respectively 4 and 8 entire caudals; and two specimens have lost the anterior temporal on both sides. *M. peruvianus* is clearly allied to *M. mertensi* of coastal Peru, from which it is distinguished by its lower number of ventrals, 193 and 211 in two males, 196 to 205 in five females. It is even more closely allied to *M. balzani* of Bolivia, from which it is separated by the lower ventral count in females; but for the enormous geographic hiatus, I would scarcely venture to distinguish it. The type measures 415 mm., tail 65.

Paratypes.—Four specimens in the Museum of Comparative Zoology. Nos. 17386, male, and 17387–89, females, were collected at Perico with the type, and agree with it very closely in form and color pattern. No. 17384, from Bellavista, to the south, in the valley of the Marañón, apparently belongs with them, but has the black rings of the body reduced to 18, and thus resembles No. 4614 of the Museum d'Histoire Naturelle in Paris from Peru, which has 19 rings. These two specimens may connect *peruvianus* with still another race of coral snake in the Marañón Valley, as yet unknown.

***Micrurus corallinus* (Wied).**

Elaps corallinus Wied, Nova Acta Acad. Leop.-Carol., 10, part 1, p. 108, pl. 4, 1820.

Micrurus corallinus Amaral, Proc. U. S. Nat. Mus., 67, Art. 24, p. 20, 1925.

Type locality.—Parahyba, Rio Frio, Rio de Janeiro, Brazil.

Range.—Eastern Brazil, from Espiritu Santo to Santa Catharina; inland to Matto Grosso.

This species, which is extremely abundant in eastern Brazil, does not appear to reach the northern states, and is absent from the Amazonian rain-forest. It will be clear from preceding remarks, under *circinalis*, and below under *dumerilii*, that I do not regard these forms as subspecifically allied to *corallinus*. Scores of adult male specimens have been examined without finding a trace of the supra-anal tubercles which are so conspicuous in the Colombian and Venezuelan forms referred to *corallinus*. Few specimens have as yet been available from the inland states of Brazil, and the Bolivian records, though not rejected here, require further study.

***Micrurus dumerilii* (Jan).**

Elaps dumerilii Jan, Rev. Mag. Zool., 1858, p. 522, 1858.

Elaps colombianus Griffin, Mem. Carnegie Mus., 7, p. 216, 1916.

Micrurus dumerilii Ruthven, Misc. Publ. Mus. Zool. Univ. Mich., 8, p. 68, 1922.

This species has conspicuous supra-anal tubercles in adult males. The black pigmentation of the red zones is concentrated at the ends of the zones adjacent to the yellow, so that an accessory narrow black ring is present on each side of the principal black ring, forming a triad, though a less perfect one than in the more completely developed triad type.

***Micrurus carinicauda* sp. nov.**

Type from Orope, Zulia, Venezuela. No. 2587 Field Museum of Natural History. Adult male. Collected in 1909 by Ned Dearborn.

Diagnosis.—A coral snake allied to *Micrurus dumerilii* in its head coloration and in having strongly developed supra-anal tubercles in the male, but without accessory black rings. The ventrals range from 183 to 196 in four males and from 196 to 214 in four females, and the caudals from 48 to 51 and from 31 to 35. The number of black rings varies from 18 to 25 on the body and 4 to 10 on the tail. The type measures 775 mm., tail 122.

Paratypes.—The known series of this species is composed of three specimens in the Naturhistorisches Museum in Basel, Nos. 9238, 9974, and 11357, from the Province of Falcon, Venezuela; three in the Naturhistorisches Museum, Vienna, two from Puerto

Cabello and one from San Esteban, Caracao, Venezuela; and No. 3936 American Museum of Natural History, also from Venezuela.

***Micrurus transandinus* sp. nov.**

Type from Andagoya, Choco, Colombia. No. 32744 Museum of Comparative Zoology. Adult male. Collected in 1915 by H. G. F. Spurrell.

Diagnosis.—Allied to forms with supra-anal tubercles and a black cap. Ventrals 188 to 200 in twelve males and 205–217 in twelve females, with caudals respectively 46–58 and 34–45; black rings from 11+7 to 16+8 in males and from 14+5 to 20+7 in females; distinguished from *M. nigrocinctus* by its black cap and from *M. clarki* by the presence of supra-anal tubercles; with many fewer black rings than *M. carinicauda*. The nearest ally to the south, *M. ecuadorianus*, likewise lacks the tubercles; the *M. dumerilii* of the Magdalena Basin, with supra-anal tubercles and with similar scale counts, differs in the invariable presence of accessory black rings.

Paratypes.—Two specimens in Field Museum, Nos. 11589–90, come from Paramba, Ecuador, as does British Museum No. 1898.4.28.84; British Museum Nos. 1901.3.29.36 and 1929.10.19.3 are also from Ecuador; in the same museum Nos. 1913.11.12.64–66, 1914.5.21.61–64, and four additional specimens without catalogue numbers, come from the Pacific slopes of Colombia; one specimen from Ecuador and one from Colombia are in the collections of the Naturhistorisches Museum, Vienna; and Nos. 32743 and 32745–46 in the Museum of Comparative Zoology are from the type locality.

***Micrurus antioquiensis* sp. nov.**

Type from Santa Rita, north of Medellin, Antioquia, Colombia. No. 1898.10.27.10 British Museum of Natural History.

Diagnosis.—A coral snake indistinguishable from *M. transandinus* of the Pacific slopes of Colombia in scale characters, but with the nuchal ring absent in a majority of the specimens. In seven specimens known from the Medellin district, the nuchal ring is absent in four, reduced to a half-ring in two, and complete in one. The ventrals vary from 189 to 204 and the caudals from 47 to 56 in five males, 216–217 and 36–42 in two females.

Paratypes.—A second specimen from Medellin in the British Museum, No. 97.11.12.16, is a male. Five specimens in the American

Museum of Natural History, Nos. 35566–70, were collected by Hermano Niceforo Maria in the Medellin region.

Remarks.—It is scarcely surprising to find a partition of the coral snakes of Colombia into geographic races by the great ranges of the Andes. The forms here described are retained as species rather than subspecies until more information regarding their distribution becomes available.

***Micrurus ecuadorianus* sp. nov.**

Type from Rio Daule, western Ecuador. No. 3559 Museum of Comparative Zoology. Adult male.

Diagnosis.—A coral snake with a black cap and the tail of the male strongly enlarged, but without supra-anal tubercles; allied therefore to *Micrurus clarki* and *M. peruvianus* (the nearest species geographically), but distinguished from these forms by the development of accessory black rings in the red zones, bordering the yellow rings. Ventrals 200–209 and caudals 43–48 in seven males, 214–223 and 33–35 in four females.

Paratypes.—A female specimen in the Museum of Comparative Zoology, No. 3569, is from the type locality, and No. 8399 in the same museum is from Guayaquil; four specimens in the British Museum, Nos. 1931.10.21.20–23, come from Ancon and Colonche, southwestern Ecuador; two specimens, No. 66–1914, in the Zoologische Staatssammlung in Munich, from Guayaquil; and two specimens with no data other than “Ecuador,” one in the Naturhistorisches Museum, Vienna, the other, No. 27636, in the American Museum of Natural History.

Remarks.—This form appears to replace *M. transandinus* of the Pacific slope of Colombia in Ecuador, but is fully distinct in the supra-anal tubercle character; it is perhaps most closely allied to *M. clarki* of Panama, but I hesitate to apply trinomials in this group until the geographic relations can be more clearly defined.

***Micrurus hemprichii* (Jan).**

Elaps hemprichii Jan, Rev. Mag. Zool., 1858, p. 523, 1858.

Micrurus hemprichii Amaral, Proc. U. S. Nat. Mus., 67, Art. 24, p. 17, 1925.

Type locality.—Colombia.

Range.—From the Guianas to Ecuador and through the Amazon Basin to Para.

A very distinct species, with the triad character of the black rings, the only species of the genus with an undivided anal plate.

***Micrurus surinamensis* (Cuvier).**

Elaps surinamensis Cuvier, Regne Animal, 2, p. 84, 1817.

Micrurus surinamensis Beebe, Zoologica, 2, p. 216, 1919.

Type locality.—Surinam.

Range.—The Guianas to Colombia, Bolivia, and Peru.

The head-shields are strongly modified in this unusually stocky and short-bodied species, the frontal being much more narrowed than in any other species of the genus. The pattern is equally distinctive, the narrow nuchal ring being the outer ring of a complete triad, and the light head-shields sharply bordered with black.

***Micrurus ancoralis ancoralis* (Jan).**

Elaps marcgravii var. *ancoralis* Jan, Icon. Gén. Ophidiens, 42, pl. 4, fig. 2, 1872.

Elaps rosenbergi Boulenger, Proc. Zool. Soc. Lond., 1898, p. 117, pl. 13, 1898.

Micrurus ancoralis Amaral, Proc. U. S. Nat. Mus., 67, Art. 24, p. 19, 1925.

Type locality.—Ecuador.

Range.—Pacific drainage of Ecuador.

Micrurus ancoralis is an extraordinarily distinct species. It is remarkable that Boulenger should have been misled into describing *rosenbergi*, based on specimens in which the first pair of labials are in contact. In the type of *ancoralis*, examined in Munich, the mental, anterior chin-shields and first labials meet in a point, so that this specimen is in fact exactly intermediate between the single specimen, British Museum *ancoralis* "b," in which there is a broad contact of the mental and chin-shields (separating the first labials), and the fifteen additional specimens in various museums in which the first labials meet.

Amaral's suggestion that *rosenbergi* be referred to the synonymy of *filiformis* is entirely untenable. After examination of all the specimens available, it is clear that the Ecuadorian specimens fall into one series and the Colombian into another, and *rosenbergi*, whose type locality is Paramba, Ecuador, falls unequivocally into the synonymy of typical *ancoralis*, so that the Colombian subspecies requires a new name.

***Micrurus ancoralis jani* subsp. nov.**

Type from Andagoya, Choco, Colombia. No. 32722 Museum of Comparative Zoology. Adult male. Collected by H. G. F. Spurrell.

Diagnosis.—A coral snake very closely allied to *Micrurus ancoralis* and replacing it in the Colombian Province of Choco; agreeing

with *ancoralis* in all essential characters, but with a consistently lower number of black triads on the body, 12–15 in males and 15–16 in females, compared with 16–23 and 18–24 in Ecuadorian *ancoralis*; ventrals and caudals 248–266 and 32–37 in males, 271–290 and 30–35 in females.

Paratypes.—Nine specimens in the British Museum from Tado, Peña Lisa, and Andagoya, collected by Messrs. Alcock, Spurrell, and Palmer; two specimens in the Naturhistorisches Museum, Vienna, from Novita, Rio San Juan, Colombia; and five specimens in the Museum of Comparative Zoology, Nos. 11151, 13270, 32720–21, 32723, from Andagoya.

Remarks.—Close agreement in the elongate body and distinctive color pattern, and contiguity of geographic range with *Micrurus ancoralis*, place *jani* unquestionably as a subspecies of that form. I take pleasure in naming this, one of the finest of all coral snakes, for Giorgio Jan, whose early descriptions of species in this genus were more sound than those of subsequent revisers.

Micrurus spixii Wagler.

Micrurus spixii Wagler, in Spix, Serp. Bras., p. 48, pl. 18, 1824.

Elaps corallinus var. *obscura* Jan, Icon. Gén. Ophidiens, 41, pl. 6, fig. 3, 1872.

Elaps heterozonus Peters, Sitzber. Ges. Naturf. Freunde, 1881, p. 52, 1881.

Elaps princeps Boulenger, Ann. Mag. Nat. Hist., (7), 15, p. 456, 1905.

Elaps ehrhardti Müller, Zool. Anz., 65, p. 198, 1926.

Type locality.—Solimões River, Amazonas.

Range.—Amazon Basin.

This species is one of the largest and most distinct of the coral snakes. In old preserved material the distinction between the yellow zones, which are unusually broad, and the red zones, may require close attention to the arrangement, which in turn may be obscured by confluence of two triads into a “quinquad” by suppression of the red zone between them. The nuchal black ring is the middle ring of a triad. The species is characterized by large size and thickness of body, presence of a few undivided caudals in the majority of specimens, broad yellow zones, and absence of sex dimorphism in length of tail. In addition to the synonyms quoted, it has frequently been identified as *Elaps marcgravii* (= *ibiboboca*) and as *lemniscatus*.

Micrurus isozonus (Cope).

Elaps isozonus Cope, Proc. Acad. Nat. Sci. Phila., 1860, p. 73, 1860.

Elaps omissus Boulenger, Ann. Mag. Nat. Hist., (9), 6, p. 110, 1920.

Type locality.—South America.

Range.—Venezuela.

This species becomes readily distinguishable with the accumulation of adequate series of specimens from Venezuela. In it the triad arrangement is constantly different from that of *Micrurus spixii*, to whose synonymy it was referred by Boulenger. It agrees in having the nuchal ring as the outer ring of the first triad, as in *frontalis*, *lemniscatus*, *ibiboboca*, etc., while in *spixii* the nuchal ring is invariably the middle ring of a triad.

***Micrurus frontalis frontalis* (Duméril and Bibron).**

Elaps frontalis Duméril and Bibron, Erpétol. Gén., 7, p. 1223, 1854.

Elaps baliocoryphus Cope, Proc. Acad. Nat. Sci. Phila., 1859, p. 346, 1859.

Type locality.—Corrientes and Misiones Territory, Argentina.

Range.—São Paulo to Rio Grande do Sul, westward to the Paraná Basin.

The use of the trinomial is necessitated by the revival of *altirostris* for the representatives of this species in Uruguay and I feel that still further races of this southernmost coral snake may prove recognizable.

***Micrurus frontalis altirostris* (Cope).**

Elaps altirostris Cope, Proc. Acad. Nat. Sci. Phila., 1859, p. 345, 1859.

Type locality.—South America.

Range.—Uruguay.

This form is distinguished from typical *frontalis* by the greater amount of yellow on the head-shields, by a shorter tail, and by a distinctively lower number of ventrals, 197–208 in males, 206–210 in females; caudals 16–20 in both sexes.

***Micrurus pyrrhocryptus* (Cope).**

Elaps pyrrhocryptus Cope, Proc. Acad. Nat. Sci. Phila., 1862, p. 347, 1862.

Elaps simonsii Boulenger, Ann. Mag. Nat. Hist., (7), 9, p. 338, 1902.

Type locality.—Vermejo River, Argentine Chaco.

Range.—Savanna country from Mendoza in the Argentine to Bolivia, eastward to the Paraguay River.

The redescription of this species as *simonsii* by Boulenger was due to the appearance of a single specimen with the first labials separated by the mental and chin-shields. That this is an anomaly is at once evident upon the examination of a series of specimens,

which agree perfectly in color pattern. No intergrades between this species and *frontalis* have been found, and it seems preferable to maintain the species as fully distinct, although the coloration of the head shows plainly that it is allied to *frontalis* rather than to *marcgravii*.

I have designated the Vermejo River as type locality because this river was ascended by the Page Expedition, and of the localities visited is by far the most likely origin for the specimen.

Micrurus ibiboboca (Merrem).

Elaps ibiboboca Merrem, Tent. Syst. Amphib., p. 142, 1820.

Elaps marcgravii Wied, Nova Acta Acad. Leop.-Carol., 10, p. 109, 1820.

Elaps gravenhorstii Jan, Rev. Mag. Zool., 1858, p. 523, 1858.

Elaps heterochilus Mocquard, Bull. Soc. Philom. Paris, (7), 11, p. 39, 1887.

Micrurus ibiboboca Amaral, Rev. Mus. Paulista, 15, p. 7, 1925.

Type locality.—Brazil.

Range.—Northeastern Brazil.

Amaral concludes that this species is synonymous with *Micrurus lemniscatus* of the Amazon Basin; *lemniscatus*, however, has a definitely higher range of ventral scales, and a still better marked difference in the number of caudals. *M. ibiboboca* is probably more closely allied to *M. frontalis* than to *M. lemniscatus*; but I regard the relations of this series of forms as one of the primary remaining taxonomic problems in the genus. I follow Amaral in referring *gravenhorstii* and *heterochilus* here. I have not seen the types.

Micrurus decoratus (Jan).

Elaps decoratus Jan, Rev. Mag. Zool., 1858, p. 525, 1858.

Elaps fischeri Amaral, Anex. Mem. Inst. Butantan, 1, p. 59, pl. 2, figs. 1-5, 1921.

Elaps ezequieli Lutz and Mello, Folha Med., 4, p. 2, 1923.

Micrurus decoratus Amaral, Mem. Inst. Butantan, 4, p. 229, 1929.

Type locality.—Mexico (in error).

Range.—Rio de Janeiro to Santa Catharina.

This species is characterized by the usual loss of the anterior temporal so that the sixth upper labial reaches the parietal; out of nine specimens examined, five have temporals 0-1, two have 0-1 on one side and 1-1 on the other, and two have 1-1 on both sides. The type of *M. fischeri* is based on the same anomalous extension of the mental to meet the anterior chin-shields which has so greatly enriched

the synonymy in this genus. The species in which this character has appeared are not necessarily in the least allied. In *M. narduccii* it is the normal condition; it appears as an accidental anomaly in *M. mipartitus*, leading to the description of *M. mentalis*; in *M. lemniscatus*, leading to *M. helleri*; in *M. pyrrhocryptus*, leading to *M. simonsii*; and in *M. decoratus*, leading to *M. fischeri*; while its existence in the type of *M. ancoralis* misled Boulenger into redescribing normal specimens of this species as *rosenbergi*. The nuchal black ring in *decoratus* is the middle ring of a triad.

Micrurus lemniscatus (Linnaeus).

Coluber lemniscatus Linnaeus, Syst. Nat., p. 224, 1758.

Micrurus lemniscatus Beebe, Zool. Logica, 2, p. 216, 1919.

Micrurus helleri Schmidt and Schmidt, Field Mus. Nat. Hist., Zool. Ser., 12, p. 129, 1925.

Elaps frontifasciatus Werner, Sitzber. Akad. Wiss. Wien, 135, p. 250, 1927.

Type locality.—Asia (in error).

Range.—The Amazon basin.

I have had repeated occasion to discuss the synonymy of this species and have myself contributed to it. In this species, as in *spixii* and *langsдорffii*, the uniformity throughout the vast region from the foothills of the Andes to the lower Amazon seems due to rapid passive dispersal during floods. This species is allied on one hand to *M. filiformis* by the occasional high ventral counts, which reach 265, and on the other to *M. ibiboboca*, as maintained by Amaral. The latter species, however, invariably has a shorter tail and lower number of caudals, 19–30 (in both sexes), as compared with 30–42 in *lemniscatus*.

Micrurus filiformis (Günther).

Elaps filiformis Günther, Proc. Zool. Soc. Lond., 1859, p. 86, pl. 17, 1859.

Micrurus filiformis Amaral, Proc. U. S. Nat. Mus., 67, Art. 24, p. 19, 1925.

Type locality.—Pará, Brazil.

Range.—Amazon Valley.

This is apparently allied directly to *Micrurus lemniscatus*, with which its range is nearly coextensive. It is presumably separated from its ally by a difference of food habits. Only about seventeen specimens are thus far known; in them the ventrals range from 269 to 321, the caudals from 34 to 45, without considering the sexes.

***Micrurus tschudii tschudii* (Jan).**

Elaps tschudii Jan, Rev. Mag. Zool., 1858, p. 524, 1858.

Micrurus tschudii Schmidt and Schmidt, Field Mus. Nat. Hist., Zool. Ser., 12, p. 132, pl. 12, 1925.

Type locality.—Peru.

Range.—Coastal Peru.

The existence of specimens of this species said to be from Bolivia, in the Museum d'Histoire Naturelle in Paris and others from Chanchamayo, Peru, in Dresden, raises difficult problems of distribution. The Peruvian locality may be the Chanchamayo in coastal Ancash, as surmised in the similar case of *Micrurus mertensi*. The specimens in Paris labeled "Bolivia," collected by Wiener, agree with my diagnosis of *olssoni* more closely than with *tschudii*, but lack the mottled snout.

***Micrurus tschudii olssoni* Schmidt and Schmidt.**

Micrurus olssoni Schmidt and Schmidt, Field Mus. Nat. Hist., Zool. Ser., 12, p. 130, pl. 11, 1925.

Type locality.—Negritos, Piura, Peru.

Range.—Desert coastal region of northwestern Peru.

This form is set off from its close ally to the south by the mottled color of the snout, and by a distinctly lower number of ventrals, 196–204 in seven males, 206–213 in five females, compared with 202–216 and 210–232 in eleven male and eight female specimens of *tschudii tschudii*. The number of triads in *olssoni* ranges only from 10 to 13, while in the typical form their number ranges from 13 to 19.

***Micrurus dissoleucus dissoleucus* (Cope).**

Elaps dissoleucus Cope, Proc. Acad. Nat. Sci. Phila., 1859, p. 345, 1859.

Type locality.—Venezuela.

Range.—Northwestern Venezuela.

In seven male specimens the ventral and caudal range is 178–193 and 24–28, and in six females 200–206 and 21–23; the type measures 578 mm., and a specimen from Maracaibo in the Naturhistorisches Museum in Basel measures about 620 mm. As in related forms, the nuchal ring forms the outer ring of an anterior triad, so that the triad formula may be written $\frac{1}{3}6+1$ or $\frac{1}{3}11+1\frac{1}{3}$, which is the actual range of variation in this character in the series.

***Micrurus dissoluteucus melanogenys* (Cope).**

Elaps melanogenys Cope, Proc. Acad. Nat. Sci. Phila., 1860, p. 72, 1860.

Elaps hollandi Griffin, Mem. Carnegie Mus., 7, p. 218, pl. 18, figs. 10–12, 1916.

Type locality.—South America.

Range.—Santa Marta region of Colombia.

This species is one of the smallest of coral snakes, distinguished by its size and different form of head from *dissoluteucus*, and with a shorter tail, with few caudals, 22–23 in males and 17–19 in females.

***Micrurus dissoluteucus dunni* Barbour.**

Micrurus dunni Barbour, Occ. Papers Mus. Zool. Univ. Mich., 129, p. 35, 1923.

Type locality.—Ancon, Canal Zone, Panama.

Range.—Panama to the Magdalena Basin, Colombia.

With only four Panama specimens of this form available, I am unable to separate the small coral snake of this type in the Magdalena Basin from them, though I strongly suspect that a fourth subspecies in this chain of forms will ultimately be distinguishable.

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